

AG Contract No: KR05-0108TRN  
ADOT ECS File: JPA 04-131  
Project No. 40NA268 IM 040-D(012)  
Project: ASU Research Projects  
Section: Jackrabbit Rd-E. Joseph  
City T.I.  
TRACS No.: H5847 01C  
Budget Source Item #: 17604

## INTERAGENCY SERVICES AGREEMENT

BETWEEN  
THE STATE OF ARIZONA  
AND  
THE ARIZONA STATE UNIVERSITY

**THIS AGREEMENT** is entered into this date March 9, 2005, pursuant to Arizona Revised Statutes § 11-951 through 11-954, as amended between the STATE OF ARIZONA, acting by and through its DEPARTMENT OF TRANSPORTATION (the "Sponsor") and the ARIZONA BOARD OF REGENTS, ARIZONA, acting for and on behalf of the THE ARIZONA STATE UNIVERSITY, (the "University").

### RECITALS

**WHEREAS** the Sponsor is empowered by Arizona Revised Statutes § 28-401 to enter into this agreement and has delegated to the undersigned the authority to execute this agreement on behalf of the Sponsor.

**WHEREAS** the University is empowered by Arizona Revised Statutes § 15-1626 to enter into this Agreement and has delegated to the undersigned authority to execute this Agreement on behalf of the University.

**WHEREAS** Sponsor desires that the University perform certain services as described in the scope of work, attached hereto and incorporated herein as Exhibit A, and the University desires to perform such services upon and subject to the terms and conditions hereinafter set forth.

**NOW, THEREFORE**, the parties agree as follows:

**ARTICLE I. SCOPE OF WORK.** The University shall use all reasonable efforts to perform the services and deliver any reports or other items specified in Exhibit A.

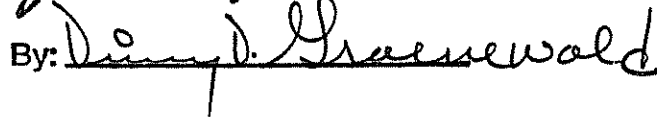
**ARTICLE II. PROJECT DIRECTOR.** The University shall provide Dr. Kamil Kaloush Department of Civil and Environmental Engineering, as Project Director for work under this Agreement. The Project Director shall not be replaced without prior consent of the Sponsor.

**ARTICLE III. PERIOD OF PERFORMANCE.** This Agreement shall begin on June 15, 2004 and shall terminate on December 31, 2005. This Agreement may be modified or extended at any time by mutual written consent of both parties.

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NO. 27408  
Filed with the Secretary of State  
Date Filed: 03/09/05

  
Secretary of State

By: 

**ARTICLE IV. SPECIAL PROVISIONS.**

1. **Compensation.** Compensation shall be on a firm-fixed-price basis. Sponsor shall pay the University a lump sum amount of \$60,000.00, for the University's services hereunder. Sponsor shall remit not less than fifty-percent (50%) (\$30,000.00), of the total contract price upon execution by both parties of this Agreement. The remaining amount of the contract price (\$30,000.00), due under this Agreement, shall be paid no more than monthly, upon receipt of invoices. Invoices are due and payable within thirty-days (30).
2. **Publications.** Sponsor recognizes that under the University's policy the results of work performed under this Agreement must be publishable and agrees that the University and its employees and students engaged in work under this Agreement shall be free to present at symposia or professional meetings, and to publish in journals, theses or dissertations, or otherwise of their own choosing, methods and results of the work performed under this Agreement. Upon written request by Sponsor, copies of proposed manuscripts will be furnished to Sponsor for review prior to publication. In no event will the University delay publication for more than thirty-days (30) from date of submittal of manuscript for Sponsor review.
3. **Confidentiality:** Sponsor and Contractor may choose, from time to time, in connection with work contemplated under this Agreement, to disclose proprietary or confidential information to each other (Confidential Information). All such disclosures must be in writing and marked as Confidential Information. The Parties will use reasonable efforts to prevent the disclosure to unauthorized third parties of any Confidential Information of the other Party and will use such information only for the purposes of this Agreement, and for three (3) years after the termination of this Agreement; provided that the receiving Party's obligations hereunder shall not apply to information that:
  - A. Is already in the receiving Party's possession at the time of disclosure; or,
  - B. Is or later becomes part of the public domain through no fault of the receiving Party; or,
  - C. Is received from a third party with no duty of confidentiality to the disclosing party; or,
  - D. Was developed independently by the receiving party prior to disclosure; or,
  - E. Is required to be disclosed by law or regulation.

Any information that is transmitted orally or visually, in order to be protected hereunder, shall be identified as such by the disclosing party at the time of disclosure, and identified in writing to the receiving party, as Confidential Information, within thirty (30) days after such oral or visual disclosure. The contractor shall retain the right to refuse acceptance of such Confidential Information, which is not required for the purposes of this agreement.

4. **Notices.** All notices under this Agreement given by either party to the other shall be in writing and shall be sent by U.S. Postal Service, first class, facsimile or e-mail. Addresses are as follows:

For THE UNIVERSITY: Office for Research & Sponsored Projects Admin.

Arizona State University  
P O. Box 873503  
Tempe, Arizona 85287-3503

Attn: Karina Lugo Ortega  
Sponsored Projects Officer  
e-mail: Klortega@asu.edu  
cc: Dr. Kamil Kaloush  
Department of Civil and  
Environmental Engineering  
Phone: 480-965-0029  
Fax: 480-965-0649

For Contracting

Arizona Department of Transportation  
Joint Project Administration  
205 S. 17<sup>th</sup> Avenue, Mail Drop 616E  
Phoenix, AZ 85007  
FAX: 602-712-7424

For Sponsor: Bharat Kandel

2407 E. Navajo Blvd  
Holbrook, AZ 86025-1828  
Phone: 928-524-6801

**ARTICLE V. GENERAL PROVISIONS.**


1. **Waivers.** No waiver, amendment or modification of this Agreement shall be valid or binding unless written and signed by the parties. Waiver by either party of any breach or default of any clause of this Agreement by the other party shall not operate as a waiver of any previous or future default or breach of the same or different clause of this Agreement.
2. **Assignment.** Neither party may assign any rights hereunder without the express, written, prior consent of both parties.
3. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Arizona.
4. **Non-Availability of Funds:** Every payment obligation of the State and University under this Agreement is conditioned upon the availability of funds appropriated or allocated for the payment of such obligation. If funds are not allocated and available for the continuance of this Agreement, this Agreement may be terminated by the State and University at the end of the period for which the funds are available. No liability shall accrue to the State and University in the event this provision is exercised as a result of termination under this paragraph.
5. **Conflict of Interest.** This Agreement is subject to the provisions of A.R.S. 38-511.
6. **Independent Contractor.** The University is an independent contractor and shall be free to exercise its discretion and independent judgment as to the method and means of performance of its work hereunder. The University employees shall not be considered employees of Sponsor, and neither the University nor Sponsor personnel will, by virtue of this Agreement, be entitled or eligible, by reason of this Agreement, to participate in any benefits or privileges given or extended by the other party to its employees.

7. **Termination.** Either party may at any time terminate this Agreement by giving the other party not less than thirty (30) days prior written notice. In the event this Agreement is canceled by Sponsor, Sponsor shall remain responsible for payment to the Univeristy for all work performed through the date of termination and for reimbursement to the Univeristy of all non-cancelable commitments but, in no event, shall reimbursement exceed the available funds appropriated for this project incurred in the conduct of the research. Non-cancelable commitments shall include employment commitments to the Univeristy personnel through the end of the semester following any such termination by Sponsor. In the event this Agreement is terminated by either party any unused funds from the advance will be returned.
8. **Arbitration.** In the event of any dispute, claim, question, or disagreement arising from or relating to this Agreement or the breach thereof, the parties hereto shall use their best efforts to settle the dispute, claim, question, or disagreement. To this effect, they shall consult and negotiate with each other in good faith and, recognizing their mutual interests, attempt to reach a just and equitable solution satisfactory to both parties. If they do not reach such solution within a period of 60 days, then, upon notice by either party to the other, all disputes, claims, questions, or differences may be settled by arbitration administered by the American Arbitration Association in accordance with the provisions of its Commercial Arbitration Rules. The provisions of Arizona Revised Statutes §35-214 are applicable to this Agreement. In the event of any controversy, which may arise out of this Agreement, the parties hereto agree to abide by required arbitration as is set forth for public works contracts in Arizona Revised Statutes § 12-1518.
9. **Insurance.** The Univeristy maintains general liability insurance and worker's compensation coverage as required by State Law and pertinent Federal Laws and regulations under the State of Arizona Risk Management Plan.
10. **Liability.** It is understood that neither party to this Agreement agrees to indemnify the other party or hold harmless the other party from liability hereunder.
11. **Nondiscrimination.** This Agreement is subject to all applicable provisions of the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101-12213) all applicable Federal Regulations under the Act, including 28 CFR Parts 35 and 36. The parties to this Agreement shall comply with Executive Order Number 99-04 issued by the Governor of the State of Arizona and incorporated herein by reference regarding "Non-Discrimination".
13. **News Release.** Sponsor may not use the name of the Univeristy in news releases, publicity, advertising, or other promotion, without the prior written consent of the Univeristy, except for documents used for internal consumption by Sponsor.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by its duly authorized representatives on the respective dates entered below.

ARIZONA BOARD OF REGENTS,  
FOR AND ON BEHALF OF  
ARIZONA STATE UNIVERSITY

STATE OF ARIZONA  
DEPARTMENT OF TRANSPORTATION

By:   
CHERYL L. CONOVER  
Interim Director Research Administration


By:   
DOUGLAS A. FORSTIE, P.E.  
Deputy State Engineer, Operations

Date: 2-17-05

Date: 02-24-05

**PROJECT DIRECTOR APPROVAL**

I have reviewed the terms of this contract and they are acceptable to me. I request that an authorized signatory execute this contract on behalf of the University.

By  2-11-05  
Kamil Kaloush Date

June 11, 2004

Mr. Bharat Kandel  
Project Sponsor  
2407 E. Navajo Blvd  
Holbrook, AZ 86025-1828

Phone: 928-524-6801

Subject: Special Testing for Asphalt Rubber Database Development - I-40, Jackrabbit –  
Joseph City TI.

Dear Mr. Kandel,

Attached are two copies of the special testing work plan for the above referenced project.  
We will start the work on this study as soon as we receive the mixtures from the  
construction project.

If you have any questions or need to discuss this work plan further, please do not hesitate  
to contact me at 480-965-5509.

I look forward to working with you on this project.

Sincerely,

Kamil E. Kaloush, Ph.D., P.E.  
Assistant Professor

*cc Jim Delton, ADOT  
Ali Zareh, ADOT  
Karina Lugo, ASU  
Matthew Witezak, ASU*

**Special Testing for Asphalt Rubber Database Development  
I-40, Jackrabbit – Joseph City TI.**

**Submitted to:**



**Project Sponsor  
2407 E. Navajo Blvd  
Holbrook, AZ 86025-1828**

**Submitted by:**

**Kamil E. Kaloush, Ph.D., P.E.  
Assistant Professor  
Department of Civil and Environmental Engineering  
Arizona State University  
Tempe, AZ 85287-5306**

**June 11, 2004**



**Ira A. Fulton School of Engineering  
Department of Civil and Environmental Engineering  
Tempe, AZ 85287-5306**

## **Research Work Plan**

### **Special Testing for Asphalt Rubber Database Development - I-40, Jackrabbit – Joseph City TI.**

#### **Introduction**

This project is a continuation of on-going efforts between the Arizona Department of Transportation (ADOT) and Arizona State University to build a database of typical engineering properties of asphalt mixtures used in Arizona. The database will be used in advancing the engineering technology and implementation of Asphalt Rubber (AR) projects. This research work combine laboratory testing and field performance to ascertain the quality of AR pavement construction.

#### **Study Objectives**

The objective of this study is to conduct a laboratory experimental program to obtain typical engineering material properties for two asphalt rubber mixtures and one conventional mixture used in the pavement rehabilitation of I-40, Jackrabbit Rd – E. Joseph City TI / IM 040-D(012), MP 268.00 – 277.44.

#### **Scope of Work**

All mixtures will be sampled during construction by FNF Construction, Inc. and in cooperation with ADOT. Approximately, 1500 lbs (or 30 five-gallon buckets) of each mix will be needed for the testing program as noted in Items 2, 3 and 4 of ADOT's Materials Design Report (July 29, 2003). In addition, five 1-gallon samples of the virgin and crumb rubber modified binders will be also collected by FNF and sent to ASU along with the mixtures. The mixes and binders will be transported to ASU laboratories. At ASU, the mixes will be re-heated and compacted using 6-inch diameter gyratory molds for triaxial specimens. Beam specimens will be compacted according to AASHTO TP8 test protocols. The target air void level for the test specimens will be similar to those achieved in the field. One 4-inch diameter samples will be cored from each gyratory plug. The sample ends will be sawed to arrive at typical test specimens of 4-inch in diameter and 6-inch in height. Thickness and bulk densities will be measured and the samples will be stored in plastic bags in preparation for the testing program outlined below.

Data obtained from these mixtures will be summarized in spreadsheets. The spreadsheet will contain information such as binder tests and information, aggregates, volumetric mix properties, and the results of the advanced dynamic material characterization tests. These tests include; triaxial shear strength, dynamic (complex) modulus, static creep and repeated load for permanent deformation characterization; indirect tensile creep test for thermal cracking characterization; and flexural beam tests for fatigue cracking evaluation. The data can be also used to establish a relative ranking of the mixtures according to their expected rutting or cracking potential.



## **Binder Tests**

ASU has been developing an AC Binder Characterization Database to develop properties of typical AC binders that are commonly used by ADOT in construction projects. The binders in this project will be also subjected to similar tests that will provide ASTM A1-VTSi consistency-temperature relationships. These tests will be conducted for original conditions and will include: Penetration at 15 and 25°C, Ring and Ball Softening Point at 60°C, and Rotational Viscosities at selected temperature range.

## **Mixture Tests**

Each mixture will be subjected to the following testing program:

### Dynamic (Complex) Modulus

Dynamic Complex) Moduli will be evaluated at a full factorial of 5 Temp levels (0, 40, 70, 100, and 130°F) and 6 frequencies (0.1, 0.5, 1, 5, 10 and 25 Hz). An electrohydraulic dynamic load system will be used to apply continuously sinusoidal loads at the temperature-frequency combinations noted. Analyses of the data will include computations of the parameters that include: phase angle and complex modulus for each mix. Master moduli curves will also be developed for each mixture. This testing will be conducted unconfined, but confined testing will be done for the open graded mixture. Three replicates will be utilized for each mix / test state condition.

### Static Creep Tests

The second type of load response test that will be conducted on each mix will be the static creep / flow time test. Three replicates will be used for each stress level and temperature combinations. Creep tests will be conducted at 100°F, in an unconfined and confined state of stress. Compliance parameters as well as the flow time (tertiary failure) will be determined from each test.

### Repeated Load Permanent Deformation Tests

The third material load response test to be conducted on each mixture will be the repeated load permanent deformation test. Similar to creep testing, permanent deformation tests will be conducted at 100°F, confined and unconfined state of stress. A haversine pulse load of 0.1 sec and 0.9 sec dwell (rest time) will be applied for a test duration of appropriately 3 hours (or until the test specimen fails). This will result in approximately 10,000 cycles. Permanent deformation and tertiary flow parameters will be obtained and analyzed for each test.

### Indirect Tensile Creep Tests

The fourth type of load response test that will be conducted on each mix will be the indirect tensile static creep test. Three replicates will be used at one stress level and three temperatures: 32, 14, -4°F. Creep tests will be conducted for about 1000 seconds, and compliance parameters will be determined from each test.

### Beam Fatigue Tests

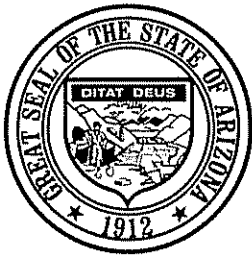
The last type of load response test that will be conducted on each mix will be the fatigue-cracking test. A constant strain test will be utilized. Three temperatures: 40, 70, and 100°F and a minimum of six strain levels will be used. Flexural parameters such as stiffness and dissipated energy will be determined from each test.

### **Documentation Report**

Upon completion of all work activities, all data will be entered into ASU asphalt rubber database, and a summary report of the results will be prepared and submitted. The testing is anticipated to be completed within 12 months from the time the mixes are received at ASU.

### **Project Cost**

The cost to conduct the work detailed in this proposal is as outlined in ADOT's Materials Design Report: a lump sum of \$20,000 per mix, three mixes for a total of **\$60,000**.



**ATTORNEY GENERAL  
CIVIL DIVISION  
TRANSPORTATION SECTION**

**MEMORANDUM**

Jeffrey T. Murray  
Assistant Attorney General

Direct: (602) 542-8859  
Fax: (602) 542-3646


**INTERGOVERNMENTAL AGREEMENT  
DETERMINATION**

A.G. Contract No. KR05-0108TRN (**JPA 04-131**), an Agreement between public agencies, has been reviewed pursuant to A.R.S. § 11-952, as amended, by the Undersigned Assistant Attorney General who has determined that it is in the proper form and is within the powers and authority granted to the State of Arizona.

No opinion is expressed as to the authority of the remaining Parties, other than the State or its agencies, to enter into said Agreement.

DATED March 3<sup>rd</sup>, 2005.

TERRY GODDARD  
Attorney General

  
\_\_\_\_\_  
JEFFREY T. MURRAY  
Assistant Attorney General  
Transportation Section

JTM:dgr  
Attachment  
893909